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ABSTRACT

A comparative study was made of teacher credential candidates who completed both an undergraduate degree and the teacher preparation program at the same California State University (CSU) campus. At each campus within the CSU system, a comparable group not seeking a teaching credential, but having the same or similar academic majors, was selected from a list of those receiving a baccalaureate degree. Comparisons were based on grade-point averages (GPA) in five categories: (1) cumulative GPA for the baccalaureate degree; (2) GPA in academic major; (3) GPA in courses earned at the campus awarding the baccalaureate; (4) GPA at the time the student began the professional education course; and (5) GPA in subjects identified as basic skills. In all five GPA comparisons, those recommended for teaching credentials varied less than a tenth of a grade point (on a four-point scale) from students in the noncredential group. However, both the in-system totals and the majority of individual campus totals indicated that credential candidates held a slight but statistically reliable advantage in GPA comparisons in all categories. (JD)

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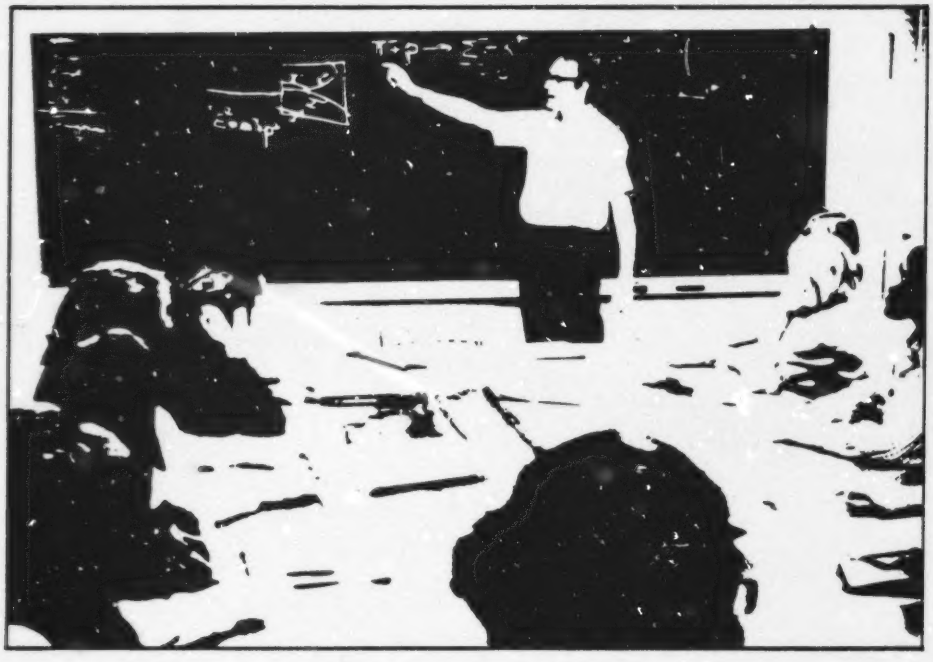
CSU

A STUDY OF THE ACADEMIC QUALIFICATIONS OF STUDENTS RECOMMENDED FOR BASIC TEACHING CREDENTIALS



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for
Academic Program Improvement

THE CALIFORNIA STATE UNIVERSITY

SP 025 550

A STUDY OF THE ACADEMIC QUALIFICATIONS OF STUDENTS RECOMMENDED FOR BASIC TEACHING CREDENTIALS

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March, 1984

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EXECUTIVE SUMMARY

It is widely believed that persons entering the teaching profession today are, in general, less successful academically than their fellow students. Scholastic Aptitude Test (SAT) scores published by the College Entrance Examination Board between 1978 and 1982 show that high school seniors taking the test and indicating a desire to enter the teaching profession scored on the average of 30 points below the national mean.* In December of 1982, the State of California administered a basic skills proficiency examination to 7,000 credential candidates, teachers, and persons considering a teaching career. The test, known as the California Basic Educational Skills Test (CBEST), was designed to evaluate competence in reading, writing, and computation. Of those taking the test at the time, 62% earned passing grades on all three sections.

In fact, neither the SAT nor the CBEST scores can be used appropriately to evaluate the academic competence of persons entering the teaching profession. Many students considering careers in teaching as high school seniors never become teachers. Also, not all persons taking the CBEST are necessarily just entering the teaching profession.

Nonetheless, because of the manner in which such data have been treated in the media, the California State University, which prepares more than half the teachers educated in California, commissioned a study of persons recommended by California State University campuses for teaching credentials between summer term 1981 and the end of spring term 1982. Dr. David Cohen, Professor of Psychology at California State College, Bakersfield, was selected by a panel of CSU administrators to conduct an independent analysis of the academic abilities of those recommended for teaching credentials. Eighteen CSU campuses participated voluntarily in the study.

The teacher credential candidates included in the study were those who completed both an undergraduate degree and the teacher preparation program at the same CSU campus. At each campus, a comparable group not seeking a teaching credential but from the same or similar academic majors was also selected at random from a list of persons receiving baccalaureate degrees between spring 1979 and spring 1982. Academic records for 2,841 credential candidates and 2,757 noncredential candidates were reviewed.

Comparisons were based on grade-point averages (GPA) in five categories: (1) Cumulative GPA for the baccalaureate degree; (2) GPA in courses earned at the campus awarding the baccalaureate; (3) GPA in the academic major; (4) GPA at the time the student began the professional education courses; and (5) GPA in subjects identified as basic skills (lower-division courses in English composition, speech, mathematics, and logic).

Because the comparisons were based on grades awarded for course work completed, students in the comparison group were selected from the same or similar academic majors and from the same institutions. This was done to avoid differences based on grading practices in other departments, schools or institutions. Because few credential candidates majored in subjects such as business, engineering or nursing, students in certain majors do not appear or appear infrequently in the study.

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*College Entrance Examination Board, Admission Testing Program, *National College-Bound High School Seniors*, Princeton, New Jersey CEEB, 1978, 1979, 1980, 1981, 1982.

Major Findings:

In all five grade-point average comparisons, those recommended for teaching credentials varied less than a tenth of a grade point (.10) on a four-point scale from students in the noncredential group. Both in system totals and on the majority of individual campuses, credential candidates held a slight but statistically reliable advantage in GPA comparisons in all categories.

While comparative grade-point averages, even in similar disciplines in the same time frame and at the same institution, do not establish conclusively the relative quality of students entering the teaching profession today, they do, nonetheless, focus on *the academic performance* of those actually completing California State University professional teacher preparation programs. On the basis of the present study, it is reasonable to conclude that, in general, those students recommended by the California State University for teaching credentials in 1981-82 were, in terms of grade-point averages, clearly the equal of their fellow students.

ACKNOWLEDGMENTS

The planning and conduct of a complex project depends upon the assistance of many individuals whose contributions often go unacknowledged. To the extent possible, I have expressed my appreciation in person to the many dozens of campus staff members who have been gracious and thoughtful during the advance preparation for our campus visits and while we were their guests. Credentials Analysts, Admissions and Records personnel, and School of Education staff all made this project possible.

Special thanks are due to Dr. Linda Bunnell Jones, whose Academic Program Improvement office provided the funding and logistical advice, to members of the Advisory Committee on the study of the Quality of Students Enrolled in Teacher Preparation Programs: Dr. Carolyn Ellner, Dean of the School of Education, CSU Northridge; Dr. Peter Facione, Dean of the School of Education, CSU Fullerton; Ms. Marjorie Lazar, Academic Program Analyst, Educational Programs and Resources; Dr. Anthony Moye, Assistant Vice Chancellor, Educational Programs and Resources; and Dr. John Nelson, retired Dean of the School of Education, CSU Long Beach; and to other members of the Chancellor's staff whose knowledge of the CSU and of teacher education was invaluable.

I appreciate the support offered collectively and on their individual campuses by the Deans of Education, whose direct involvement in this project helped to establish our legitimacy on the campuses and who, in many small ways, made the campus visits productive and in some cases helped to avoid imminent catastrophe.

Student assistants from CSC Bakersfield made essential contributions to this labor-intensive project. Barbara Blair, Justina Karnadi, Diane Spadacini, and Susan Whitney were flawless in calculating, coding, and entering data. I cannot say enough about the talents and good humor of my four traveling companions who joined me in hectic campus data collection visits, but I state here the sentiments expressed privately in acknowledging the superb contributions of Cornel Artho, Shelby Bentz, Barbara Stanton, and Carol Stiff.

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INTRODUCTION

Public education has been subjected to an increasing barrage of criticism in recent years, ranging from concerns about curriculum and amount of time students spend in K-12 classrooms to the qualifications and compensation of their teachers. Embedded within some of the criticism is the implication that the teaching profession does not attract talented and academically qualified college students. There is a general belief that students who complete their credentials are weaker in basic skills and proficiency in their major than other college graduates who are not preparing to enter the teaching profession.

Recent evidence purporting to address the question of the abilities of persons entering the teaching profession includes the Educational Testing Service study of SAT scores obtained by high school students and the California Basic Educational Skills Tests results from the initial administrations of that new test in California. Both are misleading. The SAT score and student questionnaire data reveal that high school students who *intend* to become teachers come disproportionately from the bottom quartile of SAT scores. However, there is no assurance that these students maintain their interest in a teaching career, that they enter and graduate from college, that they are admitted to teacher education programs, or that they complete those programs. The self-reported intention of those persons to become teachers is far-removed from their actual entrance into the teaching profession. Furthermore, other high school students who expressed a different career objective on the SAT questionnaire and who scored higher on the SAT examinations may ultimately become teachers.

The CBEST data are also likely to be misleading as evidence of the qualifications of newly trained teachers. Those taking the test include an unknown mix of newly credentialed teachers, mid-career teachers, prospective entrants into teacher education programs, and others.

Because of concern about the qualifications of students who receive teaching credentials through CSU programs, the CSU Deans of Education supported the Chancellor's Office interest in a study which would provide the kinds of information needed to respond appropriately to public concerns. This report describes a study conducted between May and November, 1983, which compares the CSU students recommended for initial teaching credentials over one year's time with comparable CSU graduates who had not at the time of their graduation indicated the intention to enter the teaching profession. Subject to the limitations described below, this study provides a new perspective on the academic qualifications of new teachers trained by the CSU.

The results presented in this report provide evidence that new teachers who received both their baccalaureate education and their teacher preparation training at CSU campuses are at least as qualified academically as their peers who do not become teachers.

I. OVERVIEW OF THE PROJECT

In the reporting year Summer 1981 through Spring 1982, according to CSU tabulations a total of 5,955 students from the 19 campuses were recommended for basic classroom teaching credentials on the basis of completion of an approved program. Individual campuses varied widely in the numbers of students making up that total (from 76 to 961), although 14 of the 19 campuses reported between 140 and 450 recommendations. Campuses also varied in their mix of single subject vs. multiple subject credential candidates.

The initial scope for this study was to determine the academic qualifications of persons going into teaching by collecting data for every student from the 5,955 receiving recommendations (subject to specific deletion criteria designed to focus the study on students who were educated within the CSU and whose education had occurred recently) and for an equally large comparison sample drawn from the same campus, gender, and major as each of the credential students.

For this study student academic qualification is defined as grade-point average indices of college-level achievement. Although there is clearly more to being a competent teacher than earning high grades in college courses, and indeed the criteria for selection into and successful completion of credential programs use grades as only one of many components, grade-point averages permit comparison of credential and noncredential graduates, reflect success in at least one component of the preparation required for a career in teaching, and are relatively easy to interpret. Thus this study is limited in its restricted definition of student quality to those aspects reflected in college grades. At the same time it is enhanced by its utilization of relatively concrete and generalizable measures which permit comparisons which would not otherwise be possible.

Another limitation of this study concerns the nature of the noncredential matching students. To strengthen the comparison between credential and noncredential students, the matching students were selected from the same (sometimes, by necessity, a "similar") major as the credential students. While this procedure facilitates examining whether it is the better, the typical, or the weaker History major who enters teaching, it does eliminate or almost eliminate from consideration the large numbers of undergraduate students in the CSU who major in Business, Nursing, Engineering, Computer Science, Social Work, and other disciplines from which very few graduates choose to enter K-12 teaching. Most majors are represented in the noncredential sample in close proportion to the extent to which students from those majors receive credential recommendations. One would need to use other sources of data to determine how the credential students compare with a more broadly representative sample of graduates.

A final consideration required to place this study in context is the result of the cross-sectional nature of the data. Credential students' grade-point averages are examined as of the data available when they completed their work for the credential recommendation in 1981-82, while the comparison students' are described by their work at that same campus at time of graduation. Although most of the credential students probably entered the teaching profession soon thereafter, campus records do not reveal how many or which of them actually sought employment in the public schools, were successful in that search, or persisted in that career. It is no more than a reasonable conjecture that the credential students in this study represent the early 1980s entrants into K-12 classroom teaching on

the basis of CSU preparation. The status of the noncredential comparison group is somewhat less clear, because an unknown subset of them may have moved on to another CSU campus or another educational institution to prepare for a credential. Each was permitted into the sample only if the records available at the CSU campus from which the baccalaureate degree was received showed no evidence of progress toward the professional education course package required for a credential.

Within the limitations and offsetting advantages of its methodology, this study describes the academic achievement of 2,841 credential recipients and their 2,757 noncredential comparison students. It provides a new perspective on the academic qualifications of students recommended for credentials on the basis of CSU programs, generally thought to be more than half of all those trained in California.

II. METHOD

How the Sample Was Drawn

The Educational Programs and Resources Division of the CSU Chancellor's Office provided an enumeration by campus of the numbers of students recommended for initial basic teaching credentials in 1981-82, totalling 5,955 students. Not all of the 5,955 were included in the study because many had received their baccalaureate degree from an institution other than the campus recommending the credential or had received the degree many years prior to the recommendation. The reasons for establishing two criteria for deleting students whose degrees were from the "wrong place" or were "too old" require some explanation.

Requiring that the baccalaureate degree be from the same campus which made the recommendation can be justified on two grounds. First, if the results are to inform campuses about the qualifications of credential recipients each educates, then the campus should have done more than provide the professional education portion of the student's experience. To focus precisely on the academic qualifications of new teachers who are *educated* in the CSU and on each of its campuses, the credential students have been restricted to those who received a degree from the campus, even though the actual number of units of credit may vary from the minimum needed to establish residency to the entire number applied to the degree. Nonetheless each credential student in the sample received at least the minimum portion of the baccalaurate degree required to establish residency and, more crucially, met that campus' *requirements* for the degree. Each of these students met the standards for a baccalaureate degree from that campus at the time the degree was awarded, in addition to meeting that campus' professional education requirements.

The second reason for deleting credential recipients whose degree was not from the campus making the credential recommendation is more practical. Because each student should be matched with someone completing the same academic requirements, it would be virtually impossible to find appropriate matching students for credential students whose degree was not from the CSU and difficult to locate appropriate matches for credential students who graduated from a different CSU campus from the one recommending the credential.

Therefore students whose baccalaureate degree was not from the campus which made the credential recommendation were not included in the study as the first deletion rule.

In addition, the study would lose its value if it included students who had met CSU and campus graduation requirements which were no longer in effect or who had been admitted to

teacher education programs under outdated criteria. Thus a second, somewhat arbitrary, deletion rule stated that the student would be dropped unless the baccalaureate degree had been awarded no earlier than Spring 1979, and no later than Spring 1982, allowing a graduation "window" of eligibility of one term more than three academic years.

Optimally, the study would have examined grade-point average data for each of the 5,955 students recommended for credentials, less those who did not have a baccalaureate degree from the recommending campus and those whose degree was prior to Spring 1979, or later than Spring 1982. The number was, however, reduced for two other reasons. Predictably, a small number of files at the campus records office were either misfiled, lost, inaccessible due to name changes or misspellings, or unavailable for other procedural reasons. If a reasonable amount of searching did not locate the file, the case was dropped. Probably no more than 1% of the possible cases were deleted because the file could not be found.

The second reason for deletion is of more concern. One large campus was unable to participate in the study, thus reducing by 1/6 the possible size of the sample. Unfortunately, the campus is large, urban, and ethnically diverse, with a relatively large number of specially admitted students. The results presented here, therefore, are less representative of the entire CSU than they might have been had all nineteen campuses participated.

In addition to students deleted from the sample, there are other students for whom some but not all of the data could be found. For example, if the file did not contain either the CSU code or the original information needed to determine the *basis for admission* to the campus or if transfer transcripts from which to determine *basic subjects* general education courses had been destroyed, there would be incomplete data for that student.

Appendix I contains the procedure followed on most campuses for collecting data, with important deviations noted.

The Matching Procedure and Definition of Variables Used in Analysis

Under ideal circumstances, a noncredential matching student was selected for each credential student by locating the credential student's name in the list of graduates and selecting as a "potential" matching student the next (in the alphabetic list) name which is the same gender, the same major, and the same term of graduation, but not also in the credential list. If there was no such name, however, the rules were relaxed to allow selection from an adjacent term of graduation or, in some cases, any term of graduation within the window. After all possible names in a particular major had been exhausted, names were selected from "similar" majors (e.g., Industrial Technology for Industrial Arts; German for Russian), with campus graduation evaluators and other academic personnel consulted for advice as to which majors, if any, might be comparable. Very often an examination of the permanent file for the potential matching student showed that the student had indeed completed or was currently enrolled in a credential program and could not be used as a matching student. Because this information became known only during the data collection visits, considerable time was spent in rematching credential students, searching for an eligible name. The record for a futile search is held for two Physical Education majors from San Francisco and San Jose, where we had to eliminate 11 possible matches before the credential students in question were matched by someone from the same gender and major who had not received and was not currently working on a credential.

Approximately 20% of the students (primarily those with majors in Liberal Studies, Physical Education, and Social Science) who were among the last to be matched on their campuses required extensive effort. In the end 84 credential students were not matched at all, either because no acceptable match could be found or because the matching student later was found to be ineligible after the data collection visit had ended. In addition on some campuses large numbers of Liberal Studies majors in the credential group were matched outside their major (typically with Child Development, Human Development, or some other multidisciplinary major) with the choice of alternative major being made at the suggestion of campus personnel. If an alternative major could not be found which had some curricular similarity to the target major, the student was left unmatched. However, the "same" major (same title) on different campuses could be very different, so that Child Development might be a sensible alternative to Liberal Studies on one campus but not on another. In addition, for some majors such as Music, a credential student with a major in Choral Music might have been matched with someone in Instrumental Music as the closest available match.

III. FINDINGS

Description of the Samples

The 18 campuses which participated in the study had recommended 4,994 students for credentials. The deletions described above resulted in 2,841 students in the credential sample on whom data were collected. Overall, the study utilized 56.9% of the credential students from the 18 participating campuses. Four campuses had 65% or more of their students meet the criteria for inclusion, with one campus represented by 81.9% of the possible students. For seven campuses, fewer than 50% of the original names were included in the data, with the lowest being 33.7%. No evidence is available to account for differences among campuses in this regard, but because less than 1% of the dropped cases resulted from inability to find files, the differences reflect variations across campuses in the extent to which their credential recipients are students with recent baccalaureates from that same campus.

The distribution of credential subject areas is presented in Table 1. The sample percentage receiving Multiple Subjects credentials (61.6%) closely matches the 59.1% reported in the systemwide enumeration for these 18 campuses. Among the single subject areas, those accounting for the largest proportions are Physical Education (12.6% of all credentials), English (3.7%), Social Science (3.6%), and Music (3.1%). The science disciplines (Life Science, Mathematics, and Physical Science) *together* account for 2.3% of all credentials. Persons receiving credentials in two teaching areas or with missing data account for less than 1%.

Comparison by Gender, Basis of Admission, Academic Major

Table 2 compares the credential and noncredential samples as to gender, basis for admission, and academic major. More than three-fourths of the students are female, and the slight difference between the two samples arises from the slightly more males who were unmatched than females; in no case was a person matched with someone of the other gender.

A significantly higher percentage of credential students than noncredential ones were regularly admitted to the campus (95.2% vs. 93.6%; $x_c^2 = 6.03$, $p < .02$), suggesting they were more likely to be showing adequate academic progress even before starting their work at the campus based on high school eligibility or prior college work.

Table 1

Distribution of Credential Areas

Credential Area	Percentage of Total
Multiple Subjects (Elementary teachers)	61.6%
Single Subject (Secondary teachers)	37.6%
Agriculture	2.1%
Art	1.7%
Business	0.6%
English	3.7%
Foreign Language	1.9%
Government	0.1%
History	1.1%
Home Economics	2.1%
Industrial Arts	2.6%
Life Science	1.2%
Mathematics	0.8%
Music	3.1%
Physical Education	12.6%
Physical Science	0.2%
Social Science	3.6%
More Than One or Unknown	0.8%

Table 2

Description of Credential and Noncredential Samples

Variable	Credential %	Noncredential %
Gender: Female	76.5%	76.9%
Basis for Admission: Regular	93.2%	93.6%
Major Cluster:		
Liberal Studies and Human Development	51.0%	23.8%
Child Development	2.9%	22.0%
Agriculture	2.3%	2.4%
Humanities	14.9%	14.1%
Social Sciences	5.2%	6.9%
Science and Mathematics	2.7%	2.7%
Business and Public Administration	0.9%	1.0%
Industrial Arts and Engineering	2.6%	2.6%
Physical Education	12.7%	11.4%
Home Economics	2.2%	6.0%
Applied Disciplines	2.4%	3.9%
More Than One, Special, or Nonexistent	0.2%	3.3%

Academic major was reduced to 11 broad categories by clustering some of the 67 actual majors in the CSU into related groups based on similarity of the discipline. Child Development was used on several campuses as an alternate match for Liberal Studies, as were Social Science and Home Economics on two other campuses. Physical Education credential students were more likely than the others to go unmatched because on some campuses most Physical Education majors entered the credential program.

Comparisons Using Grade-Point Averages

The principal purpose for conducting this study was to examine the academic records of the credential recipients in comparison with similar students who were not going into teaching. The data were examined in two ways. (1) Grade-point averages (GPA) were compared for all pairs of students matched on the basis of gender, major and campus. (2) Among credential candidates, comparisons were made between those recommended for Single Subject (secondary schools) and Multiple Subject (elementary school) credentials. Two distinct comparisons of matched pairs were made: one of all matched pairs (the same or similar academic majors); the other of pairs with identical majors only.

Comparisons Among All Matched Cases

Table 3 presents the mean GPAs for all of the matched pairs. In every instance the results would be identical if the unmatched credential subjects were included as well. In the discussion below, results from other analyses not listed in tables will be provided as appropriate. Results are summarized for each GPA variable separately.

Baccalaureate GPA

Baccalaureate GPA is the GPA for *all units* taken up to the time of the baccalaureate degree, from all institutions. Credential students have a mean GPA which is .08 grade points higher than their matched students, and this difference is equally true for those receiving Single Subject and Multiple Subjects credentials. Although a .08 grade point difference seems small, it is highly reliable and points to a statistical difference in grades between the groups. Campuses differ greatly. The difference in favor of credential students is as high as .30 grade points on one campus. On two campuses noncredential students have higher GPAs. Regularly admitted credential students had a higher mean GPA (3.09 vs. 2.86) than special admits, but neither gender nor academic major had a significant effect on the credential vs. noncredential difference. Campuses had significant differences, however, in the mean GPA itself, ranging from 2.86 to 3.19.

Campus GPA

Campus GPA is the GPA for all units from that campus applied to the baccalaureate degree. Table 3 shows the same results for campus GPA with a statistically significant advantage for credential students in both credential categories. The variations across campuses are similar, with the same two campuses again having higher GPAs for noncredential students. Difference scores were unaffected by gender (.09 for each), but regularly admitted credential students had significantly higher GPAs (3.14 vs. 2.93) than specially admitted ones. Campuses varied as to mean campus GPA for all students, from 2.94 to 3.33, and the credential vs. noncredential difference was significantly affected by major.

Major GPA

Major GPA is the GPA for work applied to the academic major in which the baccalaureate degree was awarded. While credential and noncredential students showed no difference overall on the GPA in the major, two distinct patterns were observed. Single Subject credential students had significantly *higher* major GPAs than their matched students, while there was a small and marginally significant difference *in the other direction* for Multiple Subjects students. The two subgroups were significantly different. While the reversal for Multiple Subjects data might be attributable in part to the need to go outside of the waiver program majors to find some of the matching subjects, those Liberal Studies majors who did not pursue a credential have slightly higher major GPAs than those receiving credentials. Regular admits had higher major GPAs than special admits (3.13 vs. 2.91). Women credential recipients had higher GPAs than men. Campuses again differ significantly as to the magnitude of the credential vs. noncredential effect, and there are large differences among the various majors as well.

Entrance to Teacher Education GPA

Entrance to Teacher Education GPA is the credential students' GPAs (transfer and campus work) calculated as of the start of the term in which the permanent record card showed the beginning of enrollment in professional education courses. As with baccalaureate and campus GPAs, credential students were approximately .08 higher than their noncredential matches, and the significant difference was found in both elementary and secondary credentials. Major and gender had no significant effects. Campuses varied greatly. Regularly admitted students had higher grades when entering teacher education programs (3.04 vs. 2.79) than special admits. As one would expect, significant differences across campuses in GPAs noted for baccalaureate and campus GPAs were found here as well.

General Education Basic Subjects GPA

General Education Basic Subjects GPA. Courses identified as basic subjects were limited to lcwer-division courses in English composition, speech, mathematics, and logic. Here, too, credential students were superior. Those regularly admitted did better than those admitted by exception. Neither gender nor major affected the credential vs. noncredential difference. There were five campuses where noncredential students had *higher* basic subjects GPAs than credential ones and some campuses with large differences in favor of credential students.

Teacher Education Courses GPA

Teacher Education Courses GPA is the GPA in all professional education courses, including post-baccalaureate ones, taken to qualify for the credential, but not including work which appears to have been taken for specialist or service credentials. This variable applies only to credential students from the 16 campuses where such courses were typically letter graded. The overall GPA in teacher education courses was 3.49 which is markedly higher than GPAs discussed previously and is higher than the mean GPA in any academic major. The nature of the courses and the fact that teacher education courses were often taken in post-baccalaureate status helps to explain this difference. But it should be noted that the campus and baccalaureate GPAs for credential students do include any teacher education courses taken before the baccalaureate. Such courses did not affect the entrance to teacher education GPAs, but some education courses were counted toward major requirements for some

credential students. There were significant campus differences (mean GPAs from 3.29 to 3.66). Females had higher GPAs (3.54 vs. 3.31), and regularly admitted students had higher GPAs (3.50 vs. 3.38) than special admits.

Comparisons Using Exact Matches Only

Table 4 presents the mean GPAs for only those pairs where the noncredential student had exactly the same major as the credential student. The 869 pairs which are eliminated in Table 4 are primarily Liberal Studies majors who had to be matched with Child Development or other majors because there were not enough Liberal Studies majors available on many campuses who were noncredential students. The 81 Single Subject cases deleted include Industrial Arts majors matched with students from Industrial Technology, Drama matched with English, etc. Table 4 contains 68.5% of the matched pairs from Table 3.

Deleting the inexact matches changes the overall results only for major and basic subjects GPAs. Primarily because of the Multiple Subjects deletions, the credential students have significantly higher major GPAs overall and within each type of credential. On the other hand, the basic subjects GPAs show less difference overall, although the credential subjects are still significantly higher, and the Multiple Subjects difference is now close to zero and significantly less than the Single Subjects difference.

Differences Among Campuses

Table 5 presents the GPA difference scores by campus using only exact match pairs. The differences among campuses is significant for campus and major GPAs and marginally significant for baccalaureate GPA. The variation in number of students from each campus and in the mix of majors and credential types among campuses makes it hazardous to use Table 5 as a basis for identifying which campuses are significantly different from each other. A conservative conclusion is that differences in the entrance to teacher education and basic skills GPAs are generally similar across the CSU, while differences in the other three GPAs are not.

Table 3

GPA Differences Between Credential and Noncredential Samples For All Matched Cases

GPA Variable	Statistic	All Cases	Multiple Subjects	Single Subject	MS vs. SS
Baccalaureate	Cred	3.08	3.09	3.05	
	Non	2.99	3.00	2.97	
	Diff	.08	.09	.09	.00
	n	2755	1721	1012	
	p	<.001	<.001	<.001	n.s.
Campus	Cred	3.13	3.15	3.10	
	Non	3.04	3.06	3.01	
	Diff	.09	.09	.09	.00
	n	2755	1721	1012	
	p	<.001	<.001	<.001	n.s.
Major	Cred	3.11	3.09	3.16	
	Non	3.11	3.11	3.11	
	Diff	.00	—.03	.05	—.08
	n	2724	1699	1003	
	p	n.s.	<.10	<.01	<.001
Entrance to Teacher Education	Cred	3.03	3.04	3.02	
	Non	2.95	2.96	2.94	
	Diff	.08	.09	.07	.00
	n	2748	1719	1007	
	p	<.001	<.001	<.001	n.s.
General Education Basic Subjects	Cred	2.93	2.96	2.87	
	Non	2.86	2.89	2.80	
	Diff	.07	.07	.06	.01
	n	2666	1669	975	
	p	<.001	<.001	<.05	n.s.

Notes: Diff = Cred-Non and in last column = MS-SS, based on values prior to rounding. All p values are two-tailed significance of dependent or independent t-tests. Twenty-two cases receiving more than one credential are omitted in MS and SS.

Table 4

GPA Differences Between Credential and Noncredential Samples
For Cases Matched with the Same Major (Exact Matches)

GPA Variable	Statistic	All Cases	Multiple Subjects	Single Subject	MS vs. SS
Baccalaureate	Cred	3.07	3.08	3.06	
	Non	2.99	3.00	2.97	
	Diff	.08	.08	.09	—.01
	n	1886	940	931	
	p	<.001	<.001	<.001	n.s.
Campus	Cred	3.12	3.13	3.11	
	Non	3.03	3.06	3.01	
	Diff	.09	.08	.10	—.02
	n	1886	940	931	
	p	<.001	<.001	<.001	n.s.
Major	Cred	3.14	3.12	3.16	
	Non	3.08	3.07	3.09	
	Diff	.06	.05	.07	—.01
	n	1861	922	924	
	p	<.001	<.01	=.001	n.s.
Entrance to Teacher Education	Cred	3.03	3.03	3.02	
	Non	2.95	2.96	2.95	
	Diff	.07	.08	.07	.00
	n	1882	939	928	
	p	<.001	<.001	<.001	n.s.
General Education Basic Subjects	Cred	2.91	2.94	2.88	
	Non	2.87	2.93	2.80	
	Diff	.04	.01	.08	—.07
	n	1817	905	897	
	p	<.05	n.s.	<.01	<.10

Notes: Diff = Cred-Non and in last column = MS-SS, based on values prior to rounding. All p values are two-tailed significance of dependent or independent t-tests. Twenty-two cases receiving more than one credential are omitted in MS and SS.

Table 5

GPA Differences by Campus for Exact Matches Only

Campus Code[1]	Baccalaureate GPA Difference[2]	Campus GPA Difference	Major GPA Difference	Entrance to Teacher Education GPA Difference	Basic Subjects GPA Difference
A	.34	.32	.30	.30	.27
B	.12	.12	.11	.12	.12
C	.12	.11	.07	.07	.13
D	.12	.10	.12	.18	.02
E	.11	.16	.11	.10	.05
F	.11	.16	.14	.12	.03
G	.10	.08	.07	.12	.07
H	.10	.12	.09	.05	.08
I	.09	.14	.11	.06	.02
J	.08	.10	.08	.01	—.08
K	.08	.10	—.01	.02	—.04
L	.07	.07	.00	.06	.02
M	.07	.05	—.02	.05	—.01
N	.04	.03	.09	.05	.05
O	—.01	.01	.02	—.06	.08
P	—.05	—.07	—.07	—.03	—.02
Q	—.06	—.05	—.04	—.02	.08
R	—.17	—.31	—.38	—.17	—.22
Overall	.08	.09	.06	.07	.04
p[3]	<.10	<.05	<.01	n.s	n.s

[1]Campuses are listed in order in Baccalaureate GPA difference.
[2]Each GPA Difference = Credential GPA — Noncredential GPA.
[3]For Oneway ANOVA

Summary of Major Findings

As compared with noncredential students from the same major, credential students show higher GPAs in all comparisons and for all variables except basic skills GPA, where the difference is not significant for the Multiple Subjects pairs. Except for the basic subjects GPAs, the mean differences are all between .05 and .10 grade points and are similar for Single Subject and Multiple Subjects credential cases. Grade-point averages among the campuses differ considerably as to the magnitude of the difference, with occasional instances of differences favoring the noncredential students. Regularly admitted students show consistently higher GPAs than special admits while gender has a more limited effect. The student's major also affects campus GPA, major GPA, and teacher education GPA differences.

Other Findings

In addition to the differences between credential and noncredential GPAs, three other interesting findings are presented here.

Percentage of Students with Low GPAs

Since mean GPAs mask the actual distribution of GPAs, it seemed useful to examine how frequently students obtained very low GPAs. With regard to the baccalaureate GPA, 5.2% of the credential students and 13.8% of the noncredential ones obtained less than 2.50, and the percentages were 0.6% and 3.2%, respectively, for GPAs less than 2.25. At the time of entrance to the teacher education program, 8.9% of credential students and 16.4% of the matched noncredential students had cumulative GPAs of less than 2.50, with 2.0% and 5.5%, respectively, below 2.25. While the percentage of credential recipients with low GPAs raises some questions about particular instances of selection and retention in teacher education programs, there is a clear superiority of credential students over noncredential ones with regard to having reasonably high GPAs.

Variability of GPAs

An incidental finding related to the distribution of GPAs within the credential and noncredential groups is that on all five of the GPA measures, the variability of GPAs was significantly greater for noncredential than for credential groups. For example, in addition to the mean difference in baccalaureate GPA of 3.08 vs. 2.99, the standard deviations (.37 vs. .42) are also significantly different. In addition to the differences in frequency of low GPAs noted above, inspection shows that, for baccalaureate GPA, *more* of the credential students (3.6% vs. 2.9%) had GPAs of *3.75 or above*, even though in general the noncredential students were "more variable." The increased variability of noncredential students seems accounted for primarily by more of them having grades at the low end of the distribution.

Correlation Among GPA Measures

Although some of the GPA measures would be expected to show large correlation with each other because of how they are defined (e.g., baccalaureate GPA contains all of the courses in the student's campus GPA), there are GPAs which show little or no methodological overlap. GPA in teacher education courses shows modest but statistically significant correlation with GPAs in the major ($r = .34$), in the basic skills ($r = .28$), and at the time of entrance to teacher education ($r = .36$). Those correlations suggest that, although grades in teacher education courses are higher than most other grades, the students who receive the highest

grades tended to be those who had performed best in general education basic skills courses, in their major, and in their college work prior to starting the professional education component. In addition, even though teacher education made up zero to a very small portion of the baccalaureate coursework, depending upon the campus and the student's time of entrance into teacher education, there is a strong ($r = .45$) correlation between the teacher education and baccalaurate GPAs. Success in teacher education courses shows considerable relationship to success as a student in general.

IV. CONCLUSION

In spite of assumptions based on high school SAT scores and results of the California Basic Educational Skills Test (CBEST) which suggest to some that teachers are lacking in academic potential and accomplishment, the present findings suggest that the academic qualifications of teachers being educated in the CSU did not differ significantly from those of their nonteacher peers. When persons who completed their initial credential work in 1981-82 are compared with other recent graduates of those same campuses who graduated in the same or similar majors, those receiving credentials were clearly the equal of their fellow students in terms of academic achievement.

APPENDIX I

DATA COLLECTION PROCEDURES

1. The project director followed up on written explanations of the project and phone calls to pertinent campus personnel with brief (2-3 hours) visits to 15 of the 19 campuses to meet with a liaison person from the School of Education (or comparable unit), credentials office personnel, and one or more persons from Admissions and Records. Agreement was reached as to how to implement the project.

2. The campus provided the names (sometimes accompanied by ID numbers and other data) of the 1981-82 credential students. Sometimes the names were part of an existing reporting document, while in other cases the names were retrieved from file cards, log books, etc., and listed for the use of this project. Usually the list was sent in advance of the data collection visit which followed, while in other instances there was no list but rather a set of credentials office file folders to be used during the data collection visit.

3. The campus provided a listing of baccalaureate degree recipients for all graduation dates commencing Spring 1979, through Spring 1982. In some cases paper lists of all graduates or of graduates in those majors represented among credential students were sent to the project director well in advance of the data collection visit, in other cases they were made available only during that visit, and in yet other instances, fiche copies or special computer runs were sent.

4. The list of credential students was shortened through elimination of students whose degree was outside the "window" of Spring 1979 to Spring 1982, or whose degree was not from the recommending campus. In a few instances, gracious credentials office personnel did the deletions before sending the lists, in other situations the pruning could be done from the information which was sent, and in about one-half of the campuses the deletions could not take place until the data collection visit.

5. During one visit of 1-4 days duration, the project director and 1-4 student assistants worked on the campus, primarily in the Records Office, examining student files for both the credential students and the non-credential matching students (selected from graduation lists) and extracting information needed to record or calculate the indices which are described below. The physical task ranged from arriving on campus with all credential student permanent records pulled and set aside for our use and with the initial set of possible matching student files (from a list we sent to the campus in advance) also pulled, at one extreme, to having to start from scratch, going through the records shelves to find each file on our own. We often received campus student assistant help, frequently had in-person help from Admissions and Records Office administrators and staff, and often were gratified at the amount of concern and cooperation we received. We occasionally were helped minimally by people who had very pressing demands on their time and who had been given little advance notice of our arrival, our needs, or even the reason for our presence. Three campuses were visited more than once; two of those were within an easy drive of the project director's home campus and were originally scheduled for a series of one-day visits, while the third required more time than anticipated.

6. We typically left the campus with data sheets for each student containing the necessary information but requiring calculation of grade-point averages and coding. On about 1/3 of the campuses, we also took with us copies of transcripts, graduation evaluations, or other documents provided by campus personnel. All of those materials were disposed of on the project director's home campus in accordance with its records security procedures. Data sheets were number-coded with the student name and campus identifying student number on a tear sheet which was removed once data collection was complete. For most campuses, there were a few students for whom incomplete data had been recorded, and in those cases someone in the records or credential office area assisted us by responding to telephoned or written inquiries after the data collection visit.

7. Data entry was accomplished with about a one-month time lag from the time the data collection was complete on a particular campus. All statistical work was carried out by the project director using the campus computer facilities.

APPENDIX II

OPERATIONAL DEFINITIONS FOR THE VARIABLES USED TO INDICATE ACADEMIC QUALIFICATIONS

1. Basis for Admission. Students who were *initially* admitted under CSU codes A, B, C, N, O, P, and V are regarded as *Regular Admits*, and all others are regarded as *Special Admits*. Where campus records indicated Admission Status, that categorization was used.

2. Baccalaureate GPA. This is the GPA for *all units* taken up to the time of the baccalaureate degree, from all institutions, as recorded on the permanent record card, calculated for the graduation evaluation, or determined by combining all transfer and campus units and grade points. It does not include any work taken after the baccalaureate.

3. Campus GPA. This is the GPA for all units *from that campus* applied to the baccalaureate degree, as recorded on the permanent record card or calculated from subtotals in the files. It does not include any work taken after the baccalaureate.

4. Major GPA. This is the GPA for work applied to the academic major in which the baccalaureate degree was awarded. In rare instances of a double major, the GPA is for the major closest to the credential area, and the noncredential matching student was chosen from that same major. On a few campuses, this GPA appears calculated in the file, and on many others there is a worksheet listing the courses applied to the major, from which a GPA can be derived. Some campuses, however, have little information in the student's permanent file concerning specific courses used to meet major requirements, and in those instances we attempted to reconstruct the major as closely as possible using campus rules (e.g., count all upper division work in the major department), but for some majors this was not feasible. For one campus, the Acting Registrar requested departments to provide concentration outlines or GPAs for students from their majors, and most of them did send them in spite of the work that required. Because the actual GPA was often not in the permanent file, this particular piece of data required an unexpectedly large amount of our data collection time, probably 50% of the entire time expended at some campuses.

5. Entrance to Teacher Education GPA. The credential student's GPA (transfer and campus work) was calculated as of the start of the term in which the permanent record card showed the beginning of enrollment in professional education courses. Often this was quite obvious, as in the case of students who did all of their teacher education work in two semester blocks of coursework. For campuses which use a different pattern, we relied on guidance from people in the credentials office as to the courses which indicate initiation of teacher education. Each noncredential student was assigned a GPA on this variable indicating his or her overall GPA at the end of that term in which he or she had earned the same number of units (or more units) than the credential person had earned when he or she began the professional education courses. For example, if the credential person had earned 97 units just prior to beginning teacher education courses, the noncredential matching person's record was examined for the term in which the 97th unit was earned; the comparable GPA was as of the end of that term.

6. Basic Subjects GPA. In general, this was the GPA in the courses the student had taken at a transfer institution and/or at the campus in the areas typically used to meet General

Education Basic Subjects requirements. Because of campus-to-campus variations in this requirement, because some students graduated under older requirements than others, and because many students met all or part of this requirement at one or more community colleges, some standardization was imposed across campuses and students. The only courses counted were lower division offerings in English Composition (one or two courses), speech (limited to one course), Mathematics (using the community college and campus lists), and Logic. Even if campuses counted them in their own General Education programs, we did not count Foreign Language, Ethnic Studies, etc. We did, for some campuses and some majors, count Business Math, Computer Science, etc., where the permanent file documents indicated that those courses were regarded as appropriate. Where only one graded course was available for this area, we treated it as missing and did not enter a score, so each GPA is based on two or more (often three to five) courses.

7. Teacher Education GPA. This is the GPA in all professional education courses, including post-baccalaureate ones, taken to qualify for the credential, but not including work which appears to have been taken for specialist or service credentials. On those two campuses where almost every course taken by most students was graded CR/NC, no GPAs were recorded for any student, but on all other campuses there were usually several letter-graded courses in this area. There is of course no corresponding GPA for the noncredential students.

APPENDIX III

THE CALIFORNIA STATE UNIVERSITY AND COLLEGES
Office of the Chancellor
400 Golden Shore
Long Beach, California 90802
(213) 590- 5708

Date: April 6, 1983

To: Vice Presidents for Academic Affairs

From: Alex C. Sherriffs
Vice Chancellor
Academic Affairs

Subject: Request for Cooperation with a Study of the Quality of Students Recommended for Basic Teaching Credentials

Teacher preparation and performance matters are high on the agenda of most of us. We need both solid facts and effective efforts at upgrading the process of teacher education. One matter of great concern has to do with the quality of those entering the teaching profession.

You have heard the often repeated assertion that the poorest students in the university elect teaching as a profession. This may be so; however, evidence is open to question, especially in California. Most often cited are responses from SAT questionnaires administered to high school seniors. Although the students scoring the lowest quartile say they intend to enter teaching, there is no assurance that they do or that if they do, that they are accepted into programs or actually graduate. What is more, no study focuses on students graduating from California universities where credential requirements force greater emphasis on an academic major than in other states.

If, and I grant "if", CSU graduates entering teaching are not among the lowest quartile, then we are doing them an injustice in not challenging this assumption and certainly discouraging able persons from considering entering teaching. In addition, accurate information as to the actual academic

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Distribution: Dr. W. Ann Reynolds
Presidents
Deans of Education
Directors of Admissions and Records
Credentials Offices
Chancellor's Office Staff
Legislative Analyst

qualifications of teachers educated within the CSU would be most useful in our efforts to explain in public discussions what our achievements are in teacher preparation and would help us assess whether improvements are needed in specific areas.

The CSU Deans of Education have expressed support for a study of the academic qualifications of persons going into teaching. Proposals were requested and David Cohen, Professor of Psychology at CSC Bakersfield was selected by a committee of Deans to conduct a study. He proposes to compare the basis of admission and the grade-point averages of students recommended for the basic credential by CSU campuses during the 1981-82 reporting year with those of persons in similar academic majors on the same campuses who did not seek a teaching credential.

Because of the importance of this project, I am requesting that your campus assist Dr. Cohen to locate information he will need. He will, of course, be working closely with Deans of Education on the various campuses, but he will require access not just to lists of persons recommended for credentials and lists of graduates by academic major, but also to data from permanent student records as well. He and his team will be visiting campuses over the next several months to search files and record all necessary data with as little interference with on-going activities as possible. He will coordinate the dates for each campus visit.

Be assured that student privacy will be protected. Once data on student performance is recorded, there will be no identification of student by name or number; all data analysis will be reported for groups.

If you require further information or clarification, please contact Dr. Linda Bunnell Jones, Associate Dean for Academic Program Improvement at (ATSS) 8-635-5714 or (213) 590-5714 or Professor David Cohen (805) 833-2363.

ACS:jw